

Notice of Allowability

Application No.

10/088,186

Applicant(s)

SHIM, KYUNG-SUP

Examiner

Joseph D. Anthony

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 6-10 [renumbered as 1-5].
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☒ hereto or 2) ☐ to Paper No. _____.
 - (b) ☐ including changes required by the proposed drawing correction filed _____, which has been approved by the Examiner.
 - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the margin according to 37 CFR 1.121(d).

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|---|
| 1 <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6 <input checked="" type="checkbox"/> Interview Summary (PTO-413), Paper No. _____. |
| 3 <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No. _____ | 7 <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9 <input type="checkbox"/> Other |

Joseph D. Anthony
Primary Examiner
Art Unit: 1714

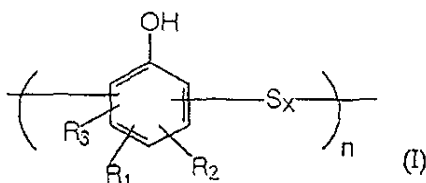
EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Authorization for the examiner's amendment was given in a telephone interview with applicant's representative, G. Gregory Schivley on 12/01/03.

The application has been amended as follows:

Claims 6 (amended) An asphalt composition, which comprises

(i) a novel aromatic polysulfide having repeating units of the following formula (I):



wherein R_1 , R_2 and R_3 are the same or different from each other, and independently represent H, unsubstituted alkyl group, substituted alkyl group, unsubstituted aryl group or substituted aryl group; x is an integer of 1-4; and n is an integer of 2-10,000, and wherein the average molecular weight of the aromatic polysulfide is from 5,000 to 20,000; and

(ii) an asphalt.

Claims 1-5 and 11-12 have been canceled.

2. The following is an examiner's statement of reasons for allowance: Claims 1-5 and 11-12 were canceled to advanced prosecution of the application. Claim 6 was amended to include a specific molecular weight range for the aromatic polysulfide. Support for said molecular weight range is found in original claim 2 and page 4, lines 17-24 of applicant's specification. The closest pieces of prior-art are deemed to be as followed.

1) Hirsch U.S. Patent Number 4,170,702 teaches a process for the polymerizing a thiobisphenol to make low molecular weight polymers which are useful as antioxidants for polyolefins, see abstract. The polymeric thiophenols of Formula I are deemed to have the same basic structure as applicant's claimed aromatic polysulfides except that they have a lower average molecular weight range of about 708 to about 3540 which is below applicant's claimed range of 5,000 to 20,000, see column 2 and the examples. Hirsch further differs from applicant's claimed invention in that there is no disclosure to incorporate the polymeric thiophenols of Formula I into asphalt.

2) Lyons U.S. Patent Number 3,986,981 teaches forming thiobisphenolic polymers as antioxidants for normally oxidizable polymers. The polymeric thiobisphenols are deemed to have the same basic structure as applicant's claimed aromatic polysulfides except that they have an average molecular weight range which is below applicant's claimed range of 5,000 to 20,000, since the average number of hindered bisphenol units is about 1 to 10, see abstract and

the examples. Lyons further differs from applicant's claimed invention in that there is no disclosure to incorporate the polymeric thiobisphenols into asphalt.

3) Onoe et al. U.S. Patent Number 4,740,578 teaches a process for producing polythiobisphenols and the process for producing mercaptophenols by the hydrogenolysis of the polythiobisphenols, see abstract. The taught polythiobisphenols are deemed to have the same basic structure as applicant's claimed aromatic polysulfides except that they have an average molecular weight range far below applicant's claimed range of 5,000 to 20,000, see column 3, lines 25 to column 5, lines 16, and the examples. Onoe et al further differs from applicant's claimed invention in that there is no disclosure to incorporate the polythiobisphenols into asphalt.

4) GB 1,121,305 teaches the preparation of chloro-organo-polysulfides. The taught chloro-organo-polysulfides are deemed to have a similar structure as applicant's claimed aromatic polysulfides but they have an average molecular weight range which is below applicant's claimed range of 5,000 to 20,000, see the examples. GB et al further differs from applicant's claimed invention in that there is no disclosure to incorporate the chloro-organo-polysulfides into asphalt.

5) JP Publication Number: 10-081680 teaches the production of cyclic phenol sulfides of Formula I, which can be polymeric, that have the same basic structure as applicant's claimed aromatic polysulfides. No specific average molecular weight range of the cyclic phenol sulfides of Formula I is set forth except that the subscript "p" in said Formula I, seems to be defined by the

publication as being "two or more integers". Although "p" could then be chosen to be a certain number that resulted in cyclic phenol sulfides that were within applicant's claimed average molecular weight range of 5,000 to 20,000, there is deemed by the examiner to be insufficient motivation to one having ordinary skill in the art to actually choose "P" to be within such values as opposed to other values that would lead to cyclic phenol sulfides that were outside of applicant's claimed average weight range. In any case, JP patentably differs from applicant's claimed invention in that there is no disclosure to the incorporation of polymeric cyclic phenol sulfides of Formula I into asphalt.

6) Butler et al. U.S. Patent Number 6,407,152 teaches method for the preparing asphalt and polymer compositions incorporating multi-component crosslinking agents. Butler et al does teach the incorporation of thiopolymers as a crosslinking agent into asphalt. Representative thiopolymers are taught to be those of U.S. patent Number 4,170,702 to Hirsch, which the examiner has described above, see the abstract and column 6, lines 20-43. As stated above Hirsch thiopolymers are outside of applicant's claimed average molecular weight range of 5,000 to 20,000. Furthermore, Butler et al is not a valid reference over applicant's claims since it has an effective filing date of 11/28/00 whereas applicant's invention has perfected foreign priority to a date of 09/15/99.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Prior-Art Cited But Not Applied

3. Any prior-art reference which is cited on FORM PTO-892 but not applied, is cited only to show the general state of the prior-art at the time of applicant's invention.

Examiner Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Joseph D. Anthony whose telephone number is (703) 308-0446 until 12/04/03; after 12/04/03 my new telephone number will be (571) 272-1117. This examiner can normally be reached on Monday through Thursday from 7:35 a.m. to 6:00 p.m. in the eastern time zone. If attempts to reach the examiner are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (703) 306-2777. The centralized FAX machine number is (703) 872-9306. All other papers received by FAX will be treated as Official communications and cannot be immediately handled by the Examiner. Any inquiry of a general nature or relating to the status of this application should be directed to the receptionist whose telephone number is (703) 308-0651. The receptionist is located on the 8th floor of Crystal Plaza 3 (e.g. CP-3) and will be the welcome point for all visitors to the building.



Joseph D. Anthony
Primary Patent Examiner
Art Unit 1714

12/02/03